87847

Page 1

July-16-12 2:25:22 PM Item ID: D212-664-101TRN Accept *N900040100* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 16/07/2012 Start Qty: 1.00 **Cust Item ID:** Req'd Qty: 1.00 **Required Date:** 30/07/2012 **Customer:** Reference: Run Approvals: Process Plan: __ MLJ Date: 17 Tooling: Date: SPC (Y/N): Date: Sequence ID/ Operation Reject Set Up/ Tool ID Tool # Plan Accept Reject Insp. Work Center ID Description **Run Hours** Qty Code Qty Number Stamp Draw Nbr **Revision Nbr** D212-664-141 Rev D (DEO) 100 0.00 MORI SEIKI CNC LATHE LARGE *100* Mori Seiki 0.00 Memo Mori Seiki CNC Lathe Large 1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA113 2-Turn first side as per Folio FA113 3-Blend transition lines only, **do not sand whole tube**: *Use mill bastard file, brush file repeatedly with file card. *Do not use sandpaper coarser than 320 grit. KC 12-7-17 110 QC1- Inspect dimensions to dimension sheet 0.00 *110* QC 0.00 Memo Quality Control

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	MANCE / UPI	DATE			
											QA Closed:	Date:	
Work Ord	ler:					DISPOSITION				AGAINST DE	PARTMENT,	/PROCESS	
Part NCR	No.					Rework Scrap Use-as-is Work Order Update		Thern	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update		Initial	Act	tion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ct	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data									•				
Equip/Tooling									4.0				
Operator							1		-2-				
Material							İ		:				
Setup					1								
Other													
Process													
Supplier				i									
Training		(-)											
Unapproved	Г											1	
							FAUI	LT CATE	GORY				
Land	ing (Gear				General							
	Г	Bending				Bend		Grain			Ovalized		Pressure/Forced
	Г	Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	Г	Cracks				Broken/Damaged		Inspect	on Incomplete		Part Incorre	ct	Weld
		Crushed/	Crimped.			Burrs		4 '	ions Incomplete/	Unclear	Part Lost/M	issing	Wrong Stock Pulled
	Γ	Cuffs	-			Contamination		Mainte	•		Part Moved	_	_ ~
		Heat Trea	at			Countersink		Mislabe			Positioned \		
		Inspectio		Tube	<u> </u>	Cut Too Short		Misrea			Power Loss	_	Other

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

July-16-12 2:25:22 PM

Revision ID:	D212-664-10			Accept	*N900	1 0401	00 *	Setup Start	14.71	eren eg e
Start Date: Required Date: 3 Reference:	16/07/2012 30/07/2012	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item Customer					
			Date:			Date:	F	Run Start Stop	"NR1"	
Sequence ID/ Work Center ID		Operation Description		Set Up/ Run Hours	Tool ID		an Accept ode Qty	Reject Qty	Reject Insp. Number Stamp	
120 Mori Seiki Mori Seiki CNC Lath	e Large	2-Blend tran	HE LARGE Ind side as per Folio FA113 Insition lines only, **do not astard file, brush file repeate	sand whole tube**:				Ø	Kc. 12	<u>-</u> 7-1
		*Do not use FOLIO REV DWG REV:	sandpaper coarser than 320							
130 *130*		QC1- Inspect dimensions	s to dimension sheet	0.00				Þ	KC 12-	-7-1
QC Quality Control		Memo + PERFORM	M ULTRA SONIC MEASU	0.00 JREMENT			1	_/		- * *



+ PERFORM ULTRA SONIC MEASUREMENT

NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	MANCE / UPD/		QA Closed:	Date	::
Work Ord Part NCR	No.		, •			DISPOSITION Rework Scrap Use-as-is Work Order Update		f Therm	Skid-tube Machining noforming Large Fab	AGAINST DEI Crosstube Small Fab Finishing Composite	Pro	VPROCESS Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root		,				ption of work order update		Initial	Actio		Sign &		
Cause		Date	Step	Qty		or Non-conformance	Cr	nief Eng	Descrip	tion	Date	Verification	QC Inspector
Doc/Data	Ш						1		*				
Equip/Tooling	Ш								1.				
Operator	Ш												
Material	Ц												
Setup	Ш				7.5								
Other	Ш												
Process	Ш												
Supplier													
Training													
Unapproved			1										
			•				FAUI	LT CATE	GORY				<u> </u>
Land					_	General		,			7	-	
		Bending				Bend	<u> </u>	Grain			Ovalized		Pressure/Forced
		Centre N	ot Conce	ntric to	o/s	BOM/Route	L	Hardwa			Over/Under	-	Temperature/Cure
	-	Cracks			·	Broken/Damaged		-1	ion Incomplete		Part Incorre	-	Weld
	\vdash	Crushed/	Crimped.			Burrs		-	ions Incomplete/Un	ıclear	Part Lost/M	issing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	enance		Part Moved		
		Heat Trea	at		L	Countersink		Mislabe	eled		Positioned V	Vrong	
		Inspectio	n Strip in	Tube	<u> </u>	Cut Too Short	L	Misread	, t		Power Loss/	Surge	Other
		Ripples ir	n Bend		L	Drill Holes		Offset	•				··
		Torque V	Vaves in E	xtrusio	n	Drawing		Out of 0	Calibration				

Out of Sequence

Outside Dimensions

Date:

DQA:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

87847

Page 3

Item ID: D212-664-101TRN Accept *N900040100* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail 16/07/2012 Start Qty: 1.00 **Start Date: Cust Item ID: Required Date:** 30/07/2012 **Req'd Qty:** 1.00 **Customer:** Reference: Run Process Plan: Date: Tooling: **Approvals:** QC: ____ Date: ____ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Reject Insp. Accept Reject **Work Center ID** Description **Run Hours** Code Qty Qty Number Stamp 140 QC8- Inspect parts - second check 0.00 *140* 0.00 Memo Quality Control + CHECK ULTRA SONIC MEASUREMENT AND ORIENTATION FOR **BENDING** 145 0.00 *145* Crosstubes 0.00 Memo Crosstubes GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY. 150 0.00 *150* HandFXtube 0.00 Memo Hand Finishing Crosstubes 1- PRESSURE WASH X-TUBE INSIDE AND OUT

2- ACID ETCH X-TUBE INSIDE AND OUT, USE RED SCOTCH BRITE

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-C	100	NFOR	MANCE / UP	DATE			
								<u> </u>			QA Closed:	Date:	:
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Work Ora	-					Rework	1	4-	Skid-tube	Crosstube]	Water Jet	Engineering
Part I	No.					Scrap		1	Machining	Small Fab	Pro	d. Eng. Coor.	Quality
	-					Use-as-is			noforming	Finishing	4	re/Packaging	Other
NCR I	No.					Work Order Update			Large Fab	Composite	1	Supplier	
	_			• • • • • • • • • • • • • • • • • • • •			•				_		
Root					Descri	ption of work order update		nitial	Ac ⁻	tion	Sign &		
Cause		Date	Step	Qty	C	or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator													
Material	Ш					o ic							
Setup	Ш		ļ										
Other	Ш			Ì									
Process	Ш					At .							
Supplier													
Training	Ш								<u> </u>				,
Unapproved													1
							AUL	T CATE	GORY				
Landi					_	General	_	1			7		1
	-	Bending				Bend	_	Grain			Ovalized		Pressure/Forced
		Centre No	ot Concei	ntric to	o/s	BOM/Route		Hardwa	ire		Over/Under	tolerance	Temperature/Cure

Inspection Incomplete

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Instructions Incomplete/Unclear

Part Incorrect

Part Moved

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Weld

Other

Wrong Stock Pulled

Broken/Damaged

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

Finish

Folio

Burrs

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Cracks

Cuffs

Heat Treat

Crushed/Crimped.

Inspection Strip in Tube

Torque Waves in Extrusion

Page 4

July-16-12 2:25:22 PM

Required Date: 30/07/2012

Item ID:

D212-664-101TRN

Accept

N900040100

Setup Start

Revision ID:

Item Name: **Start Date:**

Crosstube Turning Detail

Start Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

16/07/2012

Date:

Date:

Tooling:

SPC (Y/N):

Date:

Date:

Run

Start

Work Center ID

160

160

Sequence ID/

Quality Control

Operation **Description**

Memo

Req'd Qty: 1.00

QC5- Inspect part completeness to step on W/O

Run Hours

Set Up/

0.00

0.00

0.00

0.00

Tool ID

Tool # Plan Code

Accept Qty

Reject **Qty**

Reject Number

Insp. \$tamp

170

170

Packaging Packaging

Packaging

Memo

Identify and Stock in kanban rack

Location: L

180

180 QC

Quality Control

QC21- Final Inspection - Work Order Release

Memo

0.00

0.00

MO

12/1/23/80 MF 01.23

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-C	COI	NFORM	MANCE / UP	DATE			
											QA Closed:	Date:	
Work Ord	or:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part f	_	*				Rework Scrap Use-as-is		ſ	Skid-tube Machining noforming	Crosstube Small Fab Finishing	4	Water Jet nd. Eng. Coor. re/Packaging	Engineering Quality Other
NCR f	No					Work Order Update]		Large Fab	Composite	1 1100/310	Supplier	
Root					Descri	ption of work order update	1	nitial	Act	tion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data	Ш												
Equip/Tooling	Ш						-						
Operator	Щ												
Material													*
Setup	Ш												
Other	Ш												
Process	Ш												
Supplier	Ц				1								
Training	Ц												
Unapproved			<u> </u>	<u> </u>								<u> </u>	
						F	AUL	T CATE	GORY				
Landi	$\overline{}$			•	_	General		1		_	٦	<u>, </u>	7
	\vdash	Bending			_	Bend		Grain			Ovalized		Pressure/Forced
	\vdash	Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Unde	r tolerance	Temperature/Cure
	$\boldsymbol{\vdash}$	Cracks				Broken/Damaged		1	ion Incomplete		Part Incorre	ļ	Weld
	-	Crushed/	Crimped.			Burrs		-	ions Incomplete/	Unclear	Part Lost/M	lissing	Wrong Stock Pulled
	Ц	Cuffs				Contamination	L	Mainte	enance		Part Moved	l	
		Heat Trea	ıt			Countersink	L	Mislabe	eled		Positioned '	Wrong	
	I li	Inspection	n Strin in	Tube		Cut Too Short		Misread	4	7."	Powerloss	/Surge	Other

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Work Order ID: 87847

D212-664-101TRN

Parent Item Name: Crosstube Turning Detail

87847

D212-664-101TRN

Start Date: 16/07/2012

Required Date: 30/07/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

Parent Item:

IPP Rev:A 08-03-06 new issue DD verified by:ec

IPP Rev B 08.04.02 removed Polish EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6005-128		Manufactured	No			120	Each	14.0000	1	1			
D6005 11	00								**				

106005-128

Crosstube Material

Location Loc Qty Loc Code LG 14 14

I an an. 12/07/16

		•
DOA.	Data	
DQA:	Date:	

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

						•		•		QA Closed:	Date:	
Work Order		• • •			DISPOSITION	*			AGAINST [EPARTMENT	/PROCESS	·.
Part No	o			······································	Rework Scrap Use-as-is] TI	M hermo	kid-tube achining of	Crosstube Small Fab Finishing	—	Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR No	D			*	Work Order Update	J	L	arge Fab	Composite		Supplier	J []
Root			5	Descr	iption of work order update	Initi	ial	Act	tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief	Eng	Desci	ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator												
Material												
Setup Other Process												
Supplier							200					
Training								***	-			
Unapproved					•							
					, <u>,</u>	AULT C	ATEG	ORY				
Landing	g Gear			_	General	_			_			
	Bending				Bend	Gra	ain			Ovalized		Pressure/Forced
	Centre N	ot Conce	ntric to (o/s	BOM/Route	Har	rdware	9	\$	Over/Under	tolerance	Temperature/Cure
	Cracks				Broken/Damaged	Ins	pectio	n Incomplete	4.1	Part Incorre	ct	Weld
	Crushed/	Crimped			Burrs	Inst	tructio	ons Incomplete/l	Unclear	Part Lost/Mi	issing	Wrong Stock Pulled
	Cuffs				Contamination	Ma	ainten	ance 💦 🦠		Part Moved		
	Heat Trea	at		L	Countersink	Mis	slabele	ed 🥡		Positioned V	Vrong	<u>_</u>
	Inspectio	n Strip in	Tube		Cut Too Short	∐ Mis	sread	₹		Power Loss/	Surge	Other
	Ripples in	Bend			Drill Holes	Off	fset	*_				•
	Torque V	Vaves in E	xtrusion	1 [Drawing	Ou	ıt of Ca	llibration	. 42			
	Turning S	equence		Γ	Finish	Ou	it of Se	quence				
	Wave/Tw	ist in Tul	oe		Folio	Ou	ıtside [Dimensions	3			

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	E7847
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	spection Sheet awing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	0.200	+/-0.010	,200			VERN	CNC-08
	R0.063	+/-0.010	.063			126	- CIOC 00
	2.740	+0.005/-0.000	2,742.	1		VOR N	CNC-03
	5.097	+/-0.030	5097	/,		VOEZ	CNC-00
	2.304	+0.005/-0.000	2.309	1		Λ	1
	2.340	+0.005/-0.000	2.347	//			
EA	2.398	+0.005/-0.000	2.403.	//			
SIDE	2.448	+0.005/-0.000	2.453	//			
	2.498	+0.005/-0.000	2503	7/1	· · · ·		
	2.549	+0.005/-0.000	2.554	1			
	2.599	+0.005/-0.000	2.604				
	2.671	+0.005/-0.000	2.674				
	2.701	+0.005/-0.000	2.704				
						77	
	0.200	+/-0.010	. 200			VERN	7
	R0.063	+/-0.010	.063			16	
	2.740	+0.005/-0.000	2-741	//		VEEN	CN16-08
	5.097	+/-0.030	5.097			4000	CN6-00
	2.304	+0.005/-0.000	2-309		·		
_ [2.340	+0.005/-0.000	2.345				
E 8	2.398	+0.005/-0.000	2-403	/_			
SIDE	2.448	+0.005/-0.000	2453				
,	2.498	+0.005/-0.000	2.503				
	2.549	+0.005/-0.000	2.554			1	
	2.599	+0.005/-0.000	2603	7			
	2.671	+0.005/-0.000	2.674	-/-:			1
	2.701	+0.005/-0.000	2,704	- / - 		4	
	126.514	+/-0.020	126,514			tone	16.22

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-C	100	NFORM	MANCE / UP	DATE			
											QA Closed:	Date:	
Work Ord	or.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Work Ord	C1.			· · · · · · · · · · · · · · · · · · ·		Rework]		Skid-tube	Crosstube		Water Jet	Engineering
Part I	No.					Scrap		ſ	Machining	Small Fab	Pro	d. Eng. Coor.	Quality
NCR I	No.					Use-as-is Work Order Update			noforming Large Fab	Finishing Composite	Rec/Sto	re/Packaging Supplier	Other
Root					Descri	ption of work order update		nitial	Ac	tion	Sign &		
Cause		Date	Step	Qty	C	or Non-conformance	Ch	ief Eng	Desc	cription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator							1						
Material													
Setup			:						*				
Other	L								. 				
Process		j	1										
Supplier	L.												
Training				1				ŧ					
Unapproved				<u> </u>									
						F/	AUL	T CATE	GORY				
Landi	_	1				General	_	,		-	•		3
		Bending				Bend .	_	Grain			Ovalized	ļ	Pressure/Forced
		Centre No	ot Concer	ntric to	o/s	BOM/Route	L	Hardwa	re		Over/Under	tolerance	Temperature/Cure
	<u></u>	Cracks				Broken/Damaged	<u>L</u>	Inspecti	on Incomplete		Part Incorre	ct	Weld
	L	Crushed/	Crimped			Burrs		4	ions Incomplete/	/Unclear	Part Lost/M	issing	Wrong Stock Pulled
	$oxedsymbol{oxed}$	Cuffs				Contamination		Mainte	nance		Part Moved		
	L	Heat Trea	t			Countersink		Mislabe	led		Positioned V	Wrong	7
	1	Inspection	n Strip in	Tube		Cut Too Short	1	Misread	1		Power Loss/	Surge	Other

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

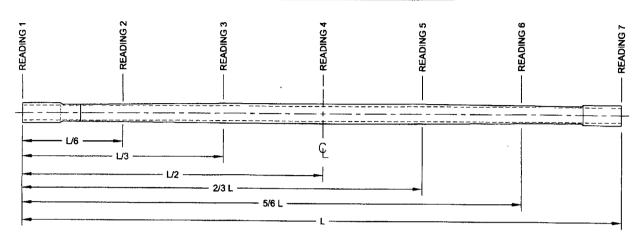
Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	FY8F3
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: D		Page 2 of 2

WALL THICKNESS MEASUREMENT



_	WALL	THICKNESS	NT (IN)	Deviation		
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE
READING 1 L= 0"	,391	.371	.371	387	oro	
READING 2 L=	. 255	.234	233	. 254	.022	
READING 3 L=	. 369	.352	.344	.356	075	
READING 4 L=	.389	.387	.378	.378	.011	0.048"
READING 5 L=	. 363	. 346	.348	361	.017	
READING 6 L=	.243	. 22-8	:249	. 26/	.023	
READING 7 L=	.384	.367	,377	.385	. 618	

Calibration Result

Actual Block Thickness: 100-500 Sitescan 250 Measured Thickness: 100-500

Measured by:	Ke	Audited by:		Preliminary Approval:	
Date:	12-7-17.	Date:	12-7-20	Date:	

Rev	Date	Change	Revised by	Approved
Α	05.04.27	New Issue (P/O D412-664-101)	KJ/JLM	
В	06.03.15	Tolerance revised for 5.097 per Dwg Rev update	KJ/JLM	
С	07.05.28	Dwg Rev updated	KJ/JLM	<u> </u>
D	10.02.02	Dimension 126.514 was 126.51	KJ , A	
Ε	12.06.04	Wall thickness form added	KJ (A)	<u> </u>

									DQA:	Date:	
NCR: Yes	/ No				WORK ORDER NON-	CONFOR	MANCE / UP		QA Closed:	Date:	
					DISPOSITION			AGAINST DE			
Work Order:					_ ,	,	a (1	- -	
Part No.			,		Rework Scrap Use-as-is	Thor	Skid-tube Crosstube Machining Small Fab Thermoforming Finishing			Water Jet	Engineering Quality Other
NCR No.					Work Order Update] Inter	Large Fab	Composite	Rec/Sto	re/Packaging Supplier	Other
Root				Descri	ption of work order update	Initial	Ac	tion	Sign &		
Cause	Date	Step	Qty	(or Non-conformance	Chief En	g Desc	cription	Date	Verification	QC Inspector
Doc/Data											
Equip/Tooling]									
Operator											
Material											
Setup ·									,		
Other											
Process											
Supplier											
Training											·
Unapproved											
						ΔΙΙΙΤ CΔΤ	FGORY				

Cracks Broken/Damaged Weld Inspection Incomplete Part Incorrect Crushed/Crimped. Burrs Instructions Incomplete/Unclear Part Lost/Missing Wrong Stock Pulled Cuffs Contamination Maintenance Part Moved Positioned Wrong Heat Treat Countersink Mislabeled Inspection Strip in Tube Misread Power Loss/Surge **Cut Too Short** Other Ripples in Bend Drill Holes Offset Torque Waves in Extrusion Drawing Out of Calibration Turning Sequence Finish Out of Sequence Folio Wave/Twist in Tube Outside Dimensions

Grain

Hardware

Pressure/Forced

Temperature/Cure

Ovalized

Over/Under tolerance

General

Bend

BOM/Route

Landing Gear

Bending

Centre Not Concentric to O/S

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Item	Qty -141	Qty -141B	Part Number	Description
1	Х		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		Х	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

1) MATERIAL: MANUFACTURED FROM D6005-128

FINISHED LENGTH = 126.514±0 020

CHEMICAL CONVERSION COAT PER DART QSI 005 4 1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2

- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664) D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES NICKS OR DENTS. DEFECTS UP TO 0 005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY RETURN TO ENGINEERING UNCONTROLLED COPY SUBJECT TO AMENDMENT WITHOUT NOTICE

REHOVED FROM WIDER REVIEW PER UNDER REVIEW SCA # 11-614

В

D	REFORMATIREVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -1418 (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, Cs-3, Cs-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4											
С			SION STRIP; ADD MAGNOBOND /ERSE CLAMPS	PH	07.03.08							
В,	ADD H SKIDTI	PH	05.02.04									
Α	NEW IS	SSUE		PH	00.12.12							
REV.			DESCRIPTION	BY	DATE							
DESIGN		PH	DART AEROSP	ACE	LTD							
DRAWN		RF	HAWKESBURY, ONTARI									
CHECKE	ED	q)	DRAWING NO.		REV. D							
MFG. AF	PR.	17	D212-664-141	s	SHEET 1 OF 4							
APPRO\	/ED	10	TITLE		SCALE							
DE APP	₹.	-#-	XTUBE ASS'Y (205/212/412	HI FWI	D) NTS							
DATE	09.0	9.30	COPYRIGHT © 2000 BY DART AS THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED NOT TO BE USED FOR ANY PURPOSE OR COME OR COMMUNICAL WILLTEN PERMISSION COMMUNICAL WILLTEN PERMISSION COMMUNICAL	ON THE EXPRE	SS CONCURON THAT IT IS							

Α

D

С

В

*											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	MANCE / UPE	DATE			
										····	QA Closed:	Date:	
Work Ord	or.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part f	No.					Rework Skid-tube Crosstube Machining Small Fab Use-as-is Thermoforming Finishing Work Order Update Large Fab Composite				4	Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other	
NCR I	No.					Work Order Update			Large Fab	Supplier			
Root					Descri	ption of work order update		Initial	Act	ion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Ch	nief Eng	Descr	iption	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator _.													
Material			j										
Setup													i
Other			İ										
Process													
Supplier													
Training													
Unapproved													
						F	AUI	LT CATE	GORY				
Landi	ng (Gear				General		_					
		Bending				Bend		Grain			Ovalized		Pressure/Forced
		Centre Not Concentric to O/S BOM/Route						Hardwa	re		Over/Under	tolerance .	Temperature/Cure
	Cracks Broken/Damaged						Inspecti	on Incomplete		Part Incorre	-	Weld	
	Crushed/Crimped. Burrs						Instruct	ions Incomplete/L	Inclear	Part Lost/M	issing	Wrong Stock Pulled	
	Cuffs Contamination					Maintenance			Part Moved	_	_		
	Heat Treat Countersink				Mislabeled			Positioned \	Vrong				
	Inspection Strip in Tube Cut Too Short				Cut Too Short	Misread Power L					Surge	Other	

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

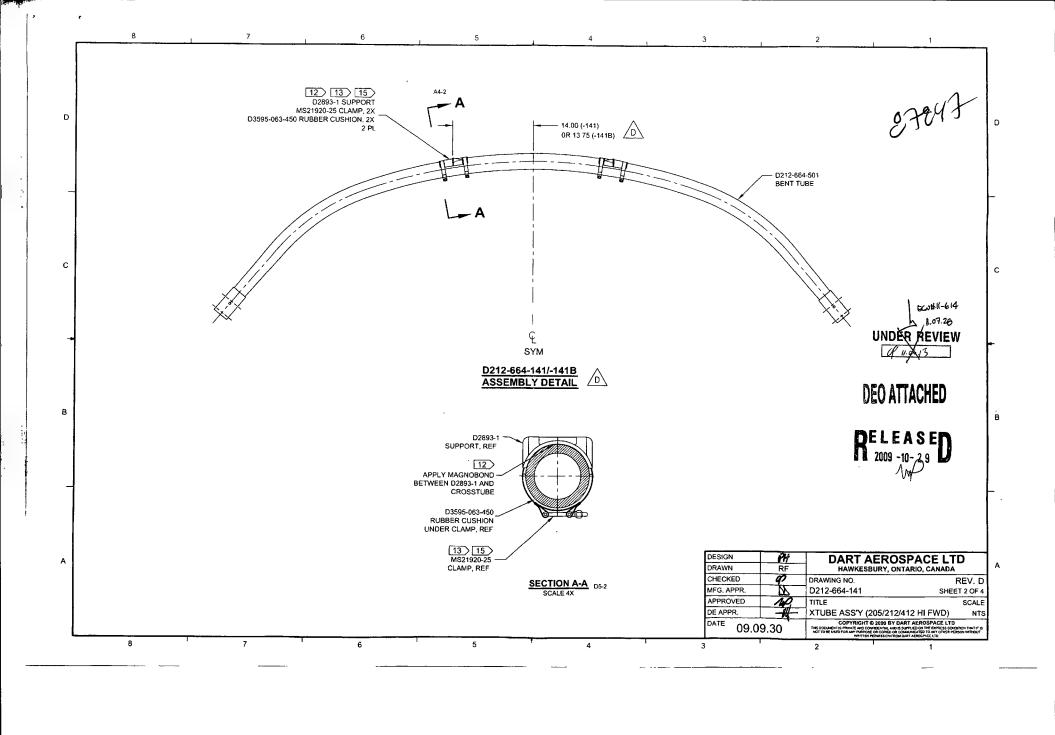
Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



												DQA:	Dat	te:	
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	MANCE / UPI	DATE		•		Ī	
											QA	Closed:	Dat	te:	
Work Ord	er.					DISPOSITION				AGAINST D	EPAF	RTMENT	PROCESS		
Part I	No.					Rework Skid-tube Crosstube Machining Small Fab Use-as-is Thermoforming Finishing Work Order Update Large Fab Composite					Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier			Engineering Quality Other	
Root					Descri	ption of work order update	1	Initial	Act	ion		Sign &			
Cause		Date	Step	Qty	C	or Non-conformance	Ch	nief Eng	Descr	ription		Date	Verification	٦	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved															
						F	AUL	LT CATE	GORY			-			
Landi		1			_	General		7			_,		,		
		Bending Centre Not Concentric to O/S Cracks Crushed/Crimped. Cuffs Heat Treat Inspection Strip in Tube				Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short		Grain Hardware Inspection Incomplete Instructions Incomplete/Unclear Maintenance Mislabeled Misread				ralized rer/Under rt Incorred rt Lost/Mi rt Moved sitioned V wer Loss/	ssing Vrong		Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
						Drill Holes	Г	Offset		<u>-</u>	_		'		

Out of Calibration

Out of Sequence

Outside Dimensions

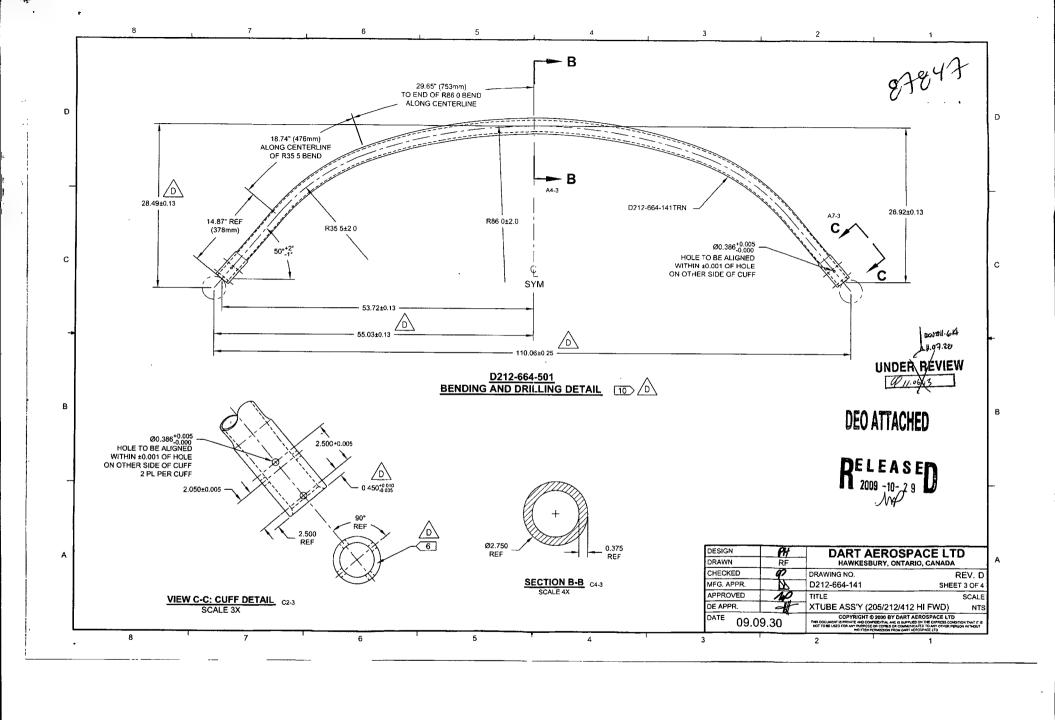
Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish



											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-	CON	FORM	MANCE / UP		QA Closed:	Date:	
Work Orde	er.					DISPOSITION				AGAINST DEI	PARTMENT	/PROCESS	
Part I	No.		•		· · · · · · · · · · · · · · · · · · ·	Rework Scrap Use-as-is Work Order Update	Machining Small Fab Thermoforming Finishing			Crosstube Small Fab Finishing Composite	Pro Rec/Stor	Engineering Quality Other	
Root				;	Descri	iption of work order update	In	itial	. Ac	ction	Sign &		•
Cause		Date	Step	Qty		or Non-conformance	Chie	ef Eng	Desc	cription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier								* '					,
Training							1						
Unapproved				<u> </u>									
							AULT	CATE	GORY				
, Landi		1				General				_	1		1
Bending Bend					Bend	1 (Grain			Ovalized		Pressure/Forced	

Hardware

Maintenance

Mislabeled

Offset -

Out of Calibration

Out of Sequence

Outside Dimensions

Misread

Inspection Incomplete

Instructions Incomplete/Unclear

Over/Under tolerance

Part Incorrect

Part Moved

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Temperature/Cure

Wrong Stock Pulled

Weld

Other

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Cracks

Cuffs

Heat Treat

Crushed/Crimped

Inspection Strip in Tube

Torque Waves in Extrusion

Centre Not Concentric to O/S

BOM/Route

Contamination

Countersink

Cut Too Short

Drill Holes

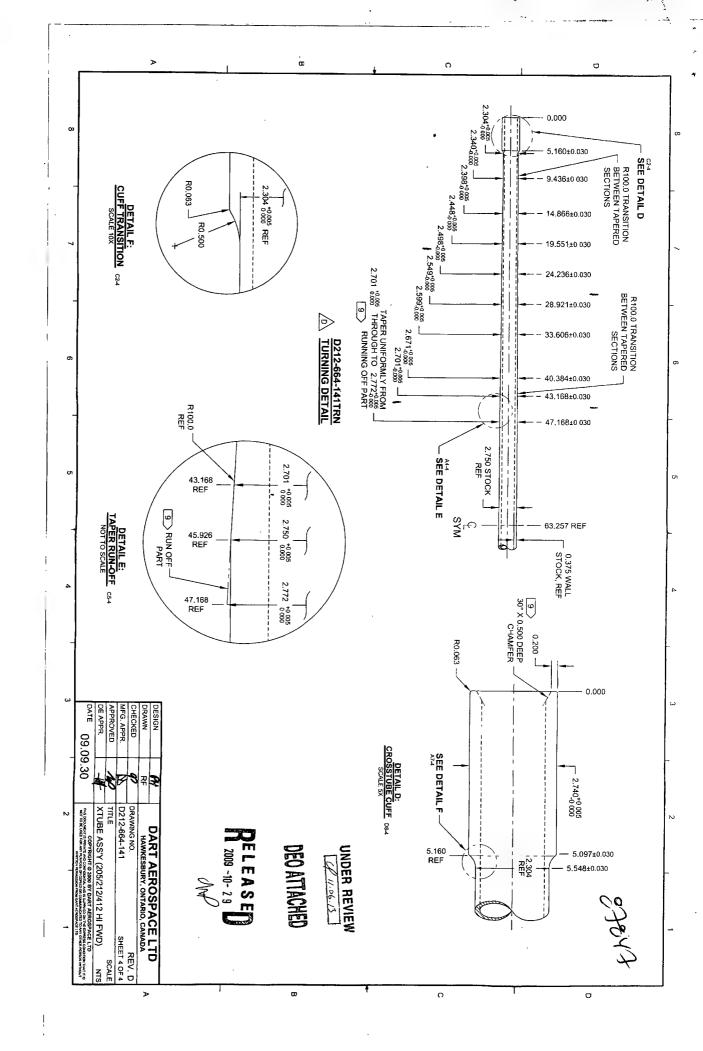
Drawing

Finish

Folio

Burrs

Broken/Damaged



												DQA:	Da	te:	
NCR:	Yes	/ No				WORK ORDER NON-CONFORMANCE / UPDATE							•		
											(QA Closed:	Da	te:	
Work Ord	er.	• • • • • • • • • • • • • • • • • • • •				DISPOSITION		·		AGAINST DE	ΕP	ARTMENT/	PROCESS		
WORK OTC	•					Rework	1		Skid-tube	Crosstube	7		Water Jet		Engineering
Part I	No.					Scrap	1		Machining	Small Fab	1	Prod. Eng. Coor.			Quality
	-					Use-as-is	1		noforming	Finishing	1		e/Packaging	-	Other
NCR I	No.			·-		Work Order Update Large Fab Composite				Supplier					
Root					Descri	ption of work order update	Ti	Initial	Actio	on	T	Sign &			
Cause		Date	Step	Qty	(or Non-conformance	Ch	nief Eng	Descri	ption		Date	Verificatio	n	QC Inspector
Doc/Data															
Equip/Tooling											1				
Operator	Ш		1								1				
Material	Ш				:						١				
Setup			<u> </u>								1				
Other	Ш										١				
Process	Ш										١			:	
Supplier	Ш								•		١				
Training	Ш														
Unapproved	Ш														
						F.	AUL	T CATE	GORY						
Landi	ng G	iear				General	_	,		_	_				•
	-	Bending				Bend	L	Grain			╛	Ovalized			Pressure/Forced
	Ш	Centre No	ot Conce	ntric to	o/s	BOM/Route		Hardwa	re		╛	Over/Under	tolerance		Temperature/Cure
	\vdash	Cracks				Broken/Damaged	L	Inspecti	on Incomplete	L	╛	Part Incorred	ct		Weld
	-	Crushed/	Crimped.			Burrs	L	4	ions Incomplete/U	nclear	╛	Part Lost/Mi	ssing		Wrong Stock Pulled
	Cuffs					Contamination	\perp	Mainte	nance			Part Moved			
	Ш	Heat Trea	it			Countersink		Mislabe	led			Positioned V	Vrong		
	Ш	Inspectio	n Strip in	Tube		Cut Too Short		Misread	ł			Power Loss/	Surge		Other
	Ripples in Bend					Drill Holes	Offset								

Out of Calibration

Outside Dimensions

Out of Sequence

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DRAWING NO.	TITLE		REV. D	DART AEROSPACE LT	D	D.E.O. NO.	SHEET NO.	SCALE
D212-664-141	XTUBE ASS	SY (205/212/412	2 HI FWD)	ENGINEERING ORDE	R	D212-664-141-D-1	SHEET 1 OF 2	NTS
DRAWN	٧	CHECKED	P	MFG. APPR. &	APF	PROVED NAP	DE APPR.	
DATE 11.0	4.07	DATE	1), (4), 1)	DATE ((.04.(2	DA1	11/04/12	DATE 11.04.12	-

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

<u> 15:</u>

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND

PAINT OUTSIDE PER DART QSI 005 4.2 REMOVE MASKING AND APPLY CLEAR COAT

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2

											DQA:	Date	2:
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFOR	MANCE / UPI	DATE			
						1		·		·	QA Closed:	Date	2:
Work Orde	er.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part N	۔ ِ No.					Rework Scrap Use-as-is Work Order Update Skid-tube Machining Small Fab Thermoforming Finishing Large Fab Composite				4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root					Descri	tion of work order update		Initial	Act	ion	Sign &		
Cause		Date	Step	Qty		or Non-conformance	1	nief Eng		iption	Date	Verification	QC Inspector
Doc/Data	П												
Equip/Tooling	П												
Operator	П												
Material	П												
Setup	П												
Other	П												
Process	П		1										
Supplier	П												
Training	П												
Unapproved	П							:					
	•		•	•		F	AUI	LT CATE	GORY				
Landi	ng G	iear				General							
	Bending Bend							Grain			Ovalized	Γ	Pressure/Forced
	Centre Not Concentric to O/S BOM/Route							Hardwa	re		Over/Under	tolerance	Temperature/Cure
	Cracks Broken/Damage					Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
	Crushed/Crimped Burrs					Burrs		Instruct	ions Incomplete/L	Jnclear	Part Lost/M	issing	Wrong Stock Pulled
	Cuffs Contamination					Contamination		Mainte	nance		Part Moved	_	
	Heat Treat Countersink					Countersink		Mislabe	led		Positioned \	V rong	
		Inspection	n Strip in	Tube		Cut Too Short				Power Loss,	/Surge	Other	
	П	Ripples in	Bend			Drill Holes	Offset				_	- L	

Out of Calibration

Outside Dimensions

Out of Sequence

Turning Sequence

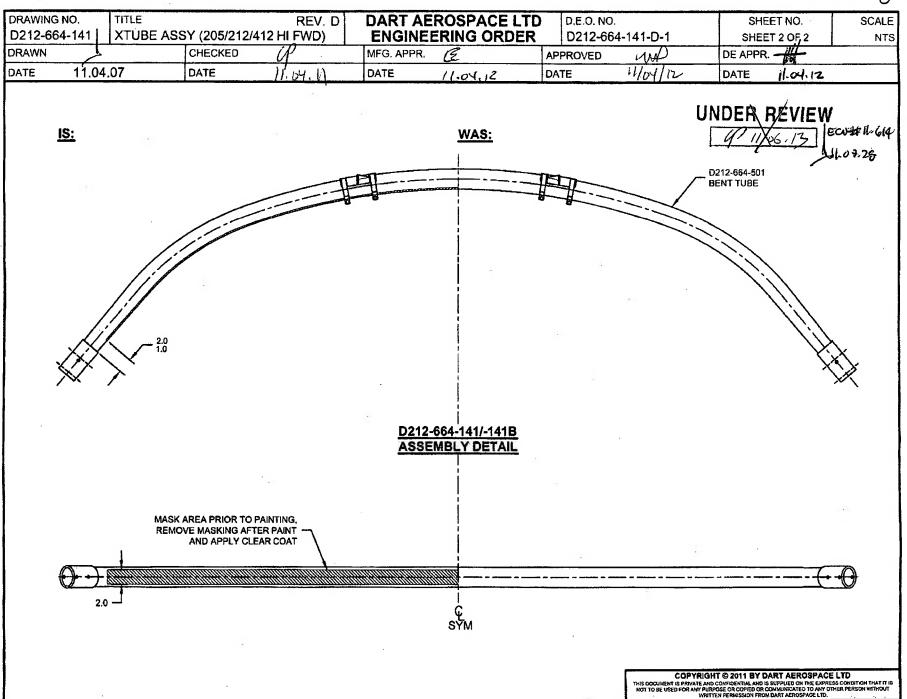
Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



DQA: _____ Date: ____

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

										QA Closed:	Date	2:
Work Order:					DISPOSITION		AGAINS			DEPARTMENT/PROCESS		
Part No. NCR No.				Rework Scrap Use-as-is Work Order Update		Therm	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root				Descri	ption of work order update	l li	nitial	Act	tion	Sign &	V	
Cause	Date	Step	Qty		or Non-conformance	Chi	ief Eng	Descr	ription	Date	Verification	QC Inspector
oc/Data quip/Tooling Operator Material Setup Other Process Supplier Training Unapproved												
	-1				F	AUL	T CATE	GORY		·		
Landing	Gear				General							
	Bending Centre Not Concentric to O/S Cracks				Bend BOM/Route Broken/Damaged Burrs		Grain Hardware Inspection Incomplete Instructions Incomplete/Unclear		Unclear	Ovalized Over/Under tolerance Part Incorrect Part Lost/Missing		Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled
F	Cuffs Heat Treat				Contamination Countersink		Maintenance			Part Moved Positioned Wrong		
	Inspection Strip in Tube				Cut Too Short		Mislabeled Misread			Positioned v		Other
	Ripples in Bend Torque Waves in Extrusion			Drill Holes	-	Offset		•				
<u> </u>			xtrusior	` -	Drawing	-		Calibration				
-	Turning Se	•	ie.		Finish Folio	\vdash		Sequence Dimensions				
	Wave/Twist in Tube				וויטווט	1 1	Outside	DITTELISIONS				

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DRAWING NO.	TITLE REV. D	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D212-664-141	CROSSTUBE ASS'Y (205 HI FWD)	ENGINEERING ORDER	D212-664-141-D-2	SHEET 1 OF 1	NTS
DRAWN /	CHECKED A>S	MFG. APPR	APPROVED MA	DE APPR.	
DATE 11.07	.15 DATE 11.07.20	DATE 11.07.21	DATE 11/07/21	DATE 11.07.2	1

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -141	Qty -141B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023
14			,	ADHESIVE (TEXTRON/BELL SPEC. 299-947-100,
				TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

- 12) TO INSTALL D2893-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT), APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



COPYRIGHT @ 2011 BY DART AEROSPACE LTD

NCR:	Yes	/	No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA:		Date:	
	···		

1	QA Closed: Date:										
Work Order: DISPOSITION				DISPOSITION	AGAINST DEPARTMENT/PROCESS						
Part No.					Rework Scrap		Skid-tube Machining	Crosstube Small Fab		Water Jet d. Eng. Coor.	Engineering Quality
NCR No.					Work Order Update	Use-as-is Thermoforming Finishing ork Order Update Large Fab Composite			Rec/Store/Packaging Other Supplier		
Root				Desci	iption of work order update	Initial	Act	ion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief Er	ng Descr	iption	Date	Verification	QC Inspector
Doc/Data				-							
quip/Tooling								•	:		
Operator	_										
Material					- T	•					
Setup											
Other		i			7				1		
Process		ļ									
Supplier	_	1									
Training					,						
Unapproved		<u> </u>									
					, ·	AULT CA	regory				
Landir	ng Gear			_	General						_
	Bending			L	Bend	Grain	Grain		Ovalized		Pressure/Forced
	Centre No	ot Conce	ntric to	o/s	BOM/Route	Hard	Hardware		Over/Under tolerance		Temperature/Cure
•	Cracks				Broken/Damaged	Inspe	Inspection Incomplete		Part Incorrect		Weld
	Crushed/	Crushed/Crimped, Burrs		Instru	Instructions Incomplete/Unclear		Part Lost/Missing		Wrong Stock Pulled		
	Cuffs Contamination		Mair	Maintenance		Part Moved		,			
-	Heat Trea	Heat Treat Countersink		Misla	Mislabeled		Positioned Wrong				
	Inspection Strip in Tube Cut Too Short		Misre	Misread		Power Loss/	Surge	Other			
	Ripples in	Ripples in Bend Drill Holes		Offse	t	•					
	Torque Waves in Extrusion Drawing			Out	Out of Calibration						
	Turning S	equence			Finish	Out	of Sequence				
	Wave/Twist in Tube Folio			Outside Dimensions							